

Brillouin linewidth characterization in single mode large effective area fiber through co-pumped technique

ABSTRACT

Brillouin linewidth has been studied experimentally for single mode large effective area fiber using the co-pumped technique. The Brillouin linewidth with different fiber lengths and its relationship with stimulated Brillouin scattering threshold power are given. Our experimental results indicate that threshold power of stimulated Brillouin scattering reduction by 23.018% using the dual-end-pumped technique to the co-pumped technique measured for -7 dBm. This ratio at threshold depends on both Brillouin pump and probe signal powers. Evolution from the non-stimulated to stimulated scattering regions is examined by calculating the linewidth of the Brillouin gain spectrum. It is shown that linewidth undergoes Brillouin gain spectrum narrowing as the Brillouin pump power is increased and probe signal power is decreased. The results highlight the narrowest Brillouin linewidth of the Stokes wave range lies between 9 MHz and 14 MHz for input probe signal power -7 dBm and 14 dBm laser pump power with different fiber lengths.

Keyword: Stimulated Brillouin scattering; Brillouin linewidth; Threshold power; Dual-end-pumped technique; Co-pumped technique